**Table S1 Pearson correlation of Cd concentration in plants of *B. napus* with plant physiological properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Leaf\_Cd | Root\_Cd | height | weight | leaf\_area | sugar | protein | chlorophyll | SOD | POD | CAT |
| Leaf\_Cd | 1 |  |  |  |  |  |  |  |  |  |  |
| Root\_Cd | .983\*\* | 1 |  |  |  |  |  |  |  |  |  |
| height | -.989\*\* | -.987\*\* | 1 |  |  |  |  |  |  |  |  |
| weight | -.978\*\* | -.932\*\* | .951\*\* | 1 |  |  |  |  |  |  |  |
| leaf\_area | -.957\*\* | -.912\*\* | .930\*\* | .969\*\* | 1 |  |  |  |  |  |  |
| sugar | -.926\*\* | -.874\*\* | .908\*\* | .944\*\* | .924\*\* | 1 |  |  |  |  |  |
| protein | .613\*\* | .479\* | -.547\* | -.706\*\* | -.691\*\* | -.742\*\* | 1 |  |  |  |  |
| chlorophyll | -.663\*\* | -.645\*\* | .652\*\* | .640\*\* | .629\*\* | .557\* | -.382 | 1 |  |  |  |
| SOD | .889\*\* | .938\*\* | -.917\*\* | -.809\*\* | -.762\*\* | -.804\*\* | .343 | -.514\* | 1 |  |  |
| POD | .326 | .443 | -.380 | -.175 | -.203 | -.252 | -.267 | -.075 | .630\*\* | 1 |  |
| CAT | -.797\*\* | -.843\*\* | .815\*\* |  .704\*\* |  .705\*\* | .610\*\* | -.154 |  .653\*\* | -.744\*\* | -.483\* | 1 |

**Table S2 Pearson correlation of Cd concentration in plants of *B. juncea* with plant physiological properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Leaf\_Cd | Root\_Cd | height | weight | leaf\_area | sugar | protein | chlorophyll | SOD | POD | CAT |
| Leaf\_Cd | 1 |  |  |  |  |  |  |  |  |  |  |
| Root\_Cd | .999\*\* | 1 |  |  |  |  |  |  |  |  |  |
| height | -.940\*\* | -.936\*\* | 1 |  |  |  |  |  |  |  |  |
| weight | -.882\*\* | -.872\*\* | .902\*\* | 1 |  |  |  |  |  |  |  |
| leaf\_area | -.747\*\* | -.731\*\* | .830\*\* | .879\*\* | 1 |  |  |  |  |  |  |
| sugar | -.761\*\* | -.747\*\* | .867\*\* | .917\*\* | .935\*\* | 1 |  |  |  |  |  |
| protein | .495\* | .479\* | -.578\* | -.654\*\* | -.644\*\* | -.726\*\* | 1 |  |  |  |  |
| chlorophyll | -.816\*\* | -.816\*\* | .832\*\* | .740\*\* | .515\* | .619\*\* | -.442 | 1 |  |  |  |
| SOD | .691\*\* | .699\*\* | -.604\*\* | -.467 | -.404 | -.391 | .290 | -.543\* | 1 |  |  |
| POD | .303 | .302 | -.268 | -.127 | -.278 | -.134 | .167 | -.183 | .308 | 1 |  |
| CAT | -.564\* | -.555\* | .644\*\* | .683\*\* | .620\*\* | .640\*\* | -.245 | .512\* | .079 | .150 | 1 |

**Table S3 The bioaccumulation factor (BAF) and translocation factor (TF) of oilseed rapes**(means±SD，n=6). Means within the same line that are followed by the different letter are significantly different at *P* < 0.05 based on one-way ANOVA.

|  |  |  |
| --- | --- | --- |
|  | *B. napus* | *B. juncea* |
|  | 10mg/kg | 30mg/kg | 10mg/kg | 30mg/kg |
| TF | .9144±.03111a | .3251±.00884c | .4750±.00930b | .3976±.00747d |
| BAF in leaf | 19.3136±1.37456a | 20.5081±2.45876a | 10.4735±.85442b | 20.0243±3.30123a |
| BAF in root | 21.1273±1.44852c | 63.0871±7.61778a | 22.0429±1.62345c | 50.4546±9.06108b |

**Table S4 Pearson correlation of Cd concentration in soils of *B. napus* with rhizosphere physicochemical properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | pH | TOC | TN | TP | NH3\_N | NO3\_N | AP | AK |
| Soil\_Cd | 1 |  |  |  |  |  |  |  |  |
| pH | -.609\*\* | 1 |  |  |  |  |  |  |  |
| TOC | -.543\* | .269 | 1 |  |  |  |  |  |  |
| TN | -.725\*\* | .387 | .386 | 1 |  |  |  |  |  |
| TP | -.525\* | .139 | .430 | .371 | 1 |  |  |  |  |
| NH3\_N | -.368 | .106 | .393 | .335 | .141 | 1 |  |  |  |
| NO3\_N | -.591\*\* | .318 | .344 | .710\*\* | .583\* | .257 | 1 |  |  |
| AP | .098 | -.301 | .185 | -.297 | .455 | -.061 | .024 | 1 |  |
| AK | .045 | .104 | -.249 | -.070 | .182 | -.073 | .018 | .214 | 1 |

**Table S5 Pearson correlation of Cd concentration in soils of *B. juncea* with rhizosphere** **physicochemical properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | pH | TOC | TN | TP | NH3\_N | NO3\_N | AP | AK |
| Soil\_Cd | 1 |  |  |  |  |  |  |  |  |
| pH | -.698\*\* | 1 |  |  |  |  |  |  |  |
| TOC | .221 | -.051 | 1 |  |  |  |  |  |  |
| TN | -.676\*\* | .786\*\* | -.065 | 1 |  |  |  |  |  |
| TP | -.217 | .093 | -.493\* | -.005 | 1 |  |  |  |  |
| NH3\_N | -.540\* | .207 | .089 | .422 | -.220 | 1 |  |  |  |
| NO3\_N | .111 | .038 | .195 | -.230 | .136 | .125 | 1 |  |  |
| AP | -.492\* | .274 | -.138 | .470\* | .244 | .464 | .061 | 1 |  |
| AK | .164 | .008 | .242 | .044 | .141 | .091 | .396 | .189 | 1 |

**Table S6 Pearson correlation of Cd concentration in soils of *B. napus* with bulk soil physicochemical properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | pH | TOC | TN | TP | NH3\_N | NO3\_N | AP | AK |
| Soil\_Cd | 1 |  |  |  |  |  |  |  |  |
| pH | -.820\*\* | 1 |  |  |  |  |  |  |  |
| TOC | -.327 | .424 | 1 |  |  |  |  |  |  |
| TN | -.833\*\* | .703\*\* | .150 | 1 |  |  |  |  |  |
| TP | -.543\* | .632\*\* | .598\*\* | .668\*\* | 1 |  |  |  |  |
| NH3\_N | -.255 | .196 | -.003 | .175 | .108 | 1 |  |  |  |
| NO3\_N | -.520\* | .545\* | .236 | .625\*\* | .634\*\* | -.062 | 1 |  |  |
| AP | .380 | -.216 | -.078 | -.384 | .064 | .412 | -.205 | 1 |  |
| AK | .433 | -.272 | -.300 | -.415 | -.302 | -.111 | -.005 | .236 | 1 |

**Table S7 Pearson correlation of Cd concentration in soils of *B. juncea* with bulk soil physicochemical properties.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | pH | TOC | TN | TP | NH3\_N | NO3\_N | AP | AK |
| Soil\_Cd | 1 |  |  |  |  |  |  |  |  |
| pH | -.978\*\* | 1 |  |  |  |  |  |  |  |
| TOC | .268 | -.223 | 1 |  |  |  |  |  |  |
| TN | -.659\*\* | .686\*\* | .033 | 1 |  |  |  |  |  |
| TP | -.389 | .452 | .259 | .645\*\* | 1 |  |  |  |  |
| NH3\_N | -.555\* | .544\* | -.368 | .771\*\* | .321 | 1 |  |  |  |
| NO3\_N | -.363 | .427 | .518\* | .667\*\* | .839\*\* | .327 | 1 |  |  |
| AP | -.427 | .454 | .421 | .626\*\* | .893\*\* | .330 | .848\*\* | 1 |  |
| AK | .667\*\* | -.655\*\* | .238 | -.279 | -.168 | -.124 | -.211 | -.159 | 1 |

**Table S8** **Pearson correlation of Cd in soils of *B. napus* with bacterial numbers.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |
| --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | Rhizosphere | Bulk soil |
| Soil\_Cd | 1 |  |  |
| Rhizosphere | .182 | 1 |  |
| Bulk soil | .514\* | .491\* | 1 |

**Table S9 Pearson correlation of Cd in soils of *B. juncea* with bacterial numbers.** \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |
| --- | --- | --- | --- |
| Pearson correlation | Soil\_Cd | Rhizosphere | Bulk soil |
| Soil\_Cd | 1 |  |  |
| Rhizosphere | .386 | 1 |  |
| Bulk soil | .175 | .160 | 1 |

**Table S10 Relationship between α-diversity of plant bacterial community in *B. napus* and environment variables.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots. \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | factor | Shannon | Inv\_simpson | Richness | Chao1 |
| Yj | height | -.099 | .244 | -.158 | -.116 |
| weight | -.061 | .332 | -.099 | -.070 |
| leaf\_area | -.008 | .409 | -.067 | -.035 |
| sugar | -.034 | .300 | -.027 | .029 |
| protein | -.032 | -.272 | .027 | .000 |
| chlorophyll | -.298 | .132 | -.457 | -.451 |
| SOD | .241 | -.004 | .222 | .169 |
| POD | .135 | .217 | .076 | .015 |
| CAT | .009 | .290 | -.079 | -.070 |
| Leaf\_Cd | .087 | -.282 | .138 | .106 |
| Yn | height | .359 | .292 | .298 | .093 |
| weight | .214 | .151 | .349 | .154 |
| leaf\_area | .210 | .145 | .315 | .155 |
| sugar | .154 | .121 | .229 | .087 |
| protein | .017 | -.050 | -.127 | -.085 |
| chlorophyll | .452 | .172 | .675\*\* | .468 |
| SOD | -.334 | -.274 | -.206 | -.057 |
| POD | -.456 | -.368 | -.028 | -.069 |
| CAT | .523\* | .316 | .331 | .049 |
| Leaf\_Cd | -.320 | -.241 | -.324 | -.121 |
| Gn | height | .620\*\* | .494\* | .546\* | .444 |
| weight | .586\* | .444 | .500\* | .390 |
| leaf\_area | .603\*\* | .470\* | .538\* | .439 |
| sugar | .595\*\* | .402 | .550\* | .466 |
| protein | -.391 | -.356 | -.347 | -.304 |
| chlorophyll | .462 | .486\* | .416 | .377 |
| SOD | -.682\*\* | -.529\* | -.594\*\* | -.502\* |
| POD | -.503\* | -.322 | -.425 | -.410 |
| CAT | .507\* | .310 | .429 | .339 |
|  | Root\_Cd | -.633\*\* | -.479\* | -.532\* | -.422 |
|  | pH | .585\* | .571\* | .524\* | .507\* |
|  | TOC | .561\* | .570\* | .554\* | .486\* |
|  | TN | .396 | .490\* | .348 | ..255 |
|  | TP | .178 | .040 | .210 | .255 |
|  | NH3 | .420 | .214 | .392 | .310 |
|  | NO3 | .253 | .291 | .182 | .058 |
|  | AP | -.214 | -.214 | -.206 | -.267 |
|  | AK | -.228 | -.203 | -.236 | -.261 |

**Table S11 Relationship between α-diversity of plant bacterial community in *B. juncea* and environment variables.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots. \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | factor | Shannon | Inv\_simpson | Richness | Chao1 |
| Yj | height | .236 | .371 | .467 | .471\* |
| weight | .143 | .223 | .453 | .455 |
| leaf\_area | .124 | .285 | .419 | .439 |
| sugar | .164 | .278 | .544\* | .575\* |
| protein | -.047 | -.161 | -.393 | -.408 |
| chlorophyll | .374 | .328 | .520\* | .484\* |
| SOD | -.063 | -.101 | -.055 | -.072 |
| POD | .227 | -.222 | .171 | .144 |
| CAT | .359 | .281 | .521\* | .495\* |
| Leaf\_Cd | -.212 | -.247 | -.387 | -.384 |
| Yn | height | .053 | .166 | -.054 | -.089 |
| weight | -.016 | -.001 | -.010 | -.116 |
| leaf\_area | .048 | .089 | .109 | -.053 |
| sugar | -.093 | -.061 | .014 | -.107 |
| protein | .154 | .079 | .085 | .131 |
| chlorophyll | -.034 | .016 | -.255 | -.239 |
| SOD | -.298 | -.291 | -.152 | -.159 |
| POD | -.402 | -.520\* | -.128 | -.131 |
| CAT | -.226 | -.161 | -.191 | -.274 |
| Leaf\_Cd | -.149 | -.235 | .042 | .081 |
| Gn | height | .216 | .208 | .232 | .242 |
| weight | .129 | .116 | .183 | .205 |
| leaf\_area | .182 | .091 | .126 | .169 |
| sugar | .176 | .065 | .151 | .112 |
| protein | -.123 | -.142 | -.067 | -.142 |
| chlorophyll | .164 | .291 | .260 | .195 |
| SOD | -.076 | -.084 | -.362 | -.341 |
| POD | .237 | .181 | .446 | .221 |
| CAT | .199 | .175 | .038 | .113 |
| Root\_Cd | -.086 | -.099 | -.138 | -.168 |
|  | pH | .205 | .243 | .228 | .051 |
| TOC | -.498\* | -.403 | -.175 | -.280 |
| TN | .359 | .255 | .280 | .062 |
| TP | .185 | .009 | .126 | .062 |
| NH3 | -.266 | -.255 | -.156 | -.120 |
| NO3 | -.284 | -.351 | -.139 | -.201 |
| AP | .453 | .180 | .272 | .086 |
| AK | -.044 | -.126 | .171 | .007 |

**Table S12 Relationship between α-diversity of soil bacterial community in *B. napus* and environment variables.** Abbreviations:R, rhizosphere soil samples; NR, bulk soil samples. \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | factor | Shannon | Inv\_simpson | Richness | Chao1 |
| R | height | .709\*\* | .657\*\* | .621\*\* | .319 |
| weight | .673\*\* | .641\*\* | .557\* | .397 |
| leaf\_area | .657\*\* | .626\*\* | .619\*\* | .224 |
| sugar | .605\*\* | .584\* | .503\* | .380 |
| protein | -.393 | -.394 | -.283 | -.486\* |
| chlorophyll | .409 | .331 | .346 | .292 |
| SOD | -.693\*\* | -.641\*\* | -.602\*\* | -.433 |
| POD | -.334 | -.306 | -.325 | -.017 |
| CAT | .650\*\* | .558\* | .563\* | -.026 |
| Soil\_Cd | -.683\*\* | -.641\*\* | -.601\*\* | -.430 |
| pH | .569\* | .540\* | .477\* | .353 |
| TOC | .475\* | .380 | .425 | .350 |
| TN | .533\* | .495\* | .455 | .330 |
| TP | .476\* | .444 | .453 | .391 |
| NH3\_N | .343 | .263 | .242 | .068 |
| NO3\_N | .661\*\* | .655\*\* | .505\* | .302 |
| AP | .192 | .278 | .300 | .293 |
| AK | .134 | .127 | .234 | .141 |
| NR | pH | .369 | .441 | .071 | -.108 |
| TOC | .279 | .329 | .274 | ..372 |
| TN | .412 | .469\* | .074 | -.148 |
| TP | .206 | .287 | .077 | .094 |
| NH3\_N | .383 | .390 | .233 | .013 |
| NO3\_N | .525\* | .519\* | .300 | .257 |
| AP | -.236 | -.308 | -.008 | .086 |
| AK | -.137 | -.105 | .017 | .023 |
| Soil\_Cd | -.593\* | -.589\* | -.261 | .088 |

**Table S13 Relationship between α-diversity of soil bacterial community in *B. juncea* and environment variables.** Abbreviations: R, rhizosphere soil samples; NR, bulk soil samples. \*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | factor | Shannon | Inv\_simpson | Richness | Chao1 |
| R | height | .445 | .617\*\* | .358 | .190 |
| weight | .500\* | .641\*\* | .404 | .301 |
| leaf\_area | .387 | .524\* | .242 | .137 |
| sugar | .461 | .589\* | .376 | .249 |
| protein | -.581\* | -.628\*\* | -.459 | -.475\* |
| chlorophyll | .366 | .479\* | .354 | .234 |
| SOD | -.469\* | -.511\* | -.434 | -.226 |
| POD | -.189 | -.243 | -.125 | -.294 |
| CAT | .136 | .279 | .049 | -.107 |
| Soil\_Cd | -.498\* | -.642\*\* | -.384 | -.353 |
| pH | .303 | .396 | .302 | .288 |
| TOC | .072 | -.074 | .088 | .069 |
| TN | .252 | .329 | .335 | .335 |
| TP | -.156 | -.075 | -.205 | -.239 |
| NH3\_N | .351 | .410 | .377 | .314 |
| NO3\_N | .047 | .026 | .109 | .032 |
| AP | .090 | .176 | .108 | .079 |
| AK | -.034 | -.077 | .155 | .154 |
| NR | pH | .608\*\* | .538\* | .678\*\* | .644\*\* |
| TOC | -.417 | -.464 | -.384 | -.302 |
| TN | .133 | .155 | .133 | .050 |
| TP | -.139 | -.160 | -.088 | -.075 |
| NH3\_N | .186 | .230 | .125 | ..043 |
| NO3\_N | -.140 | -.176 | -.100 | -.099 |
| AP | -.275 | -.269 | -.159 | -.071 |
| AK | -.579\* | -.649\*\* | -.692\*\* | -.662\* |
| Soil\_Cd | -.572\* | -.546\* | -.659\* | -.650\*\* |

**Table S14 Relative abundance of major phylum of bacterial community in phyllosphere samples** (means±SD，n=6).Means within the same line that are followed by the different letter are significantly different at P < 0.05 based on one-way ANOVA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phylum  |  | *B. napus* |  |  | *B. juncea* |  |
|  | CK | Cd10 | Cd30 | CK | Cd10 | Cd30 |
| Proteobacteria | 68.2±17.9a | 62.0±17.4a | 63.3±14.0a | 48.1±10.2a | 63.0±13.0a | 64.3±19.1a |
| Actinobacteria | 14.6±9.2b | 23.0±16.9ab | 25.7±13.0ab | 32.6±7.2a | 19.7±9.1ab | 18.5±9.8ab |
| Firmicutes | 9.4±5.7a | 10.4±6.6a | 5.1±2.3a | 11.6±17.7a | 4.3±2.8a | 2.3±2.6a |
| Bacteroidetes | 3.4±3.2a | 2.8±3.1a | 3.1±1.3a | 2.5±1.2a | 10.5±19.8a | 13.2±22.5a |
| Acidobacteria | 1.7±1.8a | 0.6±0.4a | 1.2±1.1a | 1.9±1.4a | 0.9±0.7a | 0.6±0.7a |
| Unclassified | 1.1±0.7ab | 0.5±0.4b | 0.7±0.3ab | 1.3±0.8a | 0.7±0.4ab | 0.4±0.4b |
| Gemmatimonadetes | 0.6±0.5ab | 0.2±0.1b | 0.3±0.1b | 0.9±0.9a | 0.3±0.3b | 0.3±0.4b |
| Chloroflexi | 0.1±0.1b | 0.1±0.1b | 0.2±0.2ab | 0.4±0.2a | 0.3±0.2ab | 0.1±0.1b |
| Nitrospirae | 0.3±0.2a | 0.2±0.1ab | 0.2±0.1ab | 0.2±0.1ab | 0.1±0.1b | 0.1±0.1b |
| other | 0.7±0.5a | 0.3±0.3bc | 0.3±0.1bc | 0.5±0.3ab | 0.3±0.2bc | 0.1±0.1c |

**Table S15 Relative abundance of major phylum of bacterial community in leaf endophyte samples** (means±SD，n=6). Means within the same line that are followed by the different letter are significantly different at P < 0.05 based on one-way ANOVA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phylum  |  | *B. napus* |  |  | *B. juncea* |  |
|  | CK | Cd10 | Cd30 | CK | Cd10 | Cd30 |
| Proteobacteria | 90.3±6.2a | 81.5±13.2ab | 95.6±3.9a | 86.8±11.7a | 71.5±20.7b | 83.4±7.5ab |
| Cyanobacteria/Chloroplast | 6.2±4.0b | 8.4±11.6ab | 2.9±3.8b | 9.0±6.1ab | 21.1±20.9a | 13.6±9.2ab |
| Firmicutes | 2.5±2.7a | 8.9±12.7a | 0.9±0.4a | 3.2±6.7a | 2.7±5.3a | 0.6±0.7a |
| Bacteroidetes | 0.2±0.2a | 0.1±0.1a | 0.2±0.2a | 0.1±0.1a | 3.8±6.3a | 1.8±3.2a |
| Actinobacteria | 0.4±0.3a | 0.7±0.7a | 0.2±0.1a | 0.6±0.3a | 0.6±0.5a | 0.3±0.4a |
| Unclassified | 0.3±0.3a | 0.1±0.2a | 0.04±0.03a | 0.2±0.3a | 0.2±0.1a | 0.1±0.2a |
| Acidobacteria | 0.1±0.1a | 0.1±0.1a | 0.1±0.1a | 0.1±0.1a | 0.2±0.1a | 0.1±0.1a |
| Chlamydiae | 0.01±0.01a | 0.03±0.03a | 0.01±0.02a | 0.01±0.02a | 0.03±0.02a | 0.02±0.1a |
| Gemmatimonadetes | 0.1±0.1a | 0.03±0.1a | 0.01±0.02a | 0.01±0.02a | 0.01±0.01a | 0.02±0.03a |
| other | 0.1±0.1a | 0.03±0.04a | 0.02±0.01a | 0.03±0.05a | 0.05±0.07a | 0.01±0.02a |

**Table S16 Relative abundance of major** **phylum of bacterial community in root endophyte samples** (means±SD，n=6). Means within the same line that are followed by the different letter are significantly different at P < 0.05 based on one-way ANOVA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phylum  |  | *B. napus* |  |  | *B. juncea* |  |
|  | CK | Cd10 | Cd30 | CK | Cd10 | Cd30 |
| Proteobacteria | 76.0±5.0ab | 67.3±7.5ab | 81.0±18.6a | 65.2±15.6b | 77.5±7.9ab | 69.9±6.8ab |
| Bacteroidetes | 13.9±3.5ab | 21.9±5.5a | 16.3±17.1ab | 7.5±3.7b | 8.3±5.9b | 13.2±6.4ab |
| Actinobacteria | 7.2±3.1bc | 7.9±2.9bc | 1.4±1.3c | 20.6±15.8a | 8.7±3.4bc | 11.9±4.5b |
| Firmicutes | 1.3±0.8ab | 0.7±0.3b | 0.8±0.4b | 4.1±3.8a | 3.4±3.5ab | 2.9±3.0ab |
| Acidobacteria | 0.6±0.3b | 0.5±0.2b | 0.2±0.3b | 1.2±0.8a | 0.7±0.4ab | 0.8±0.5ab |
| Unclassified | 0.4±0.2a | 0.7±0.9a | 0.1±0.1a | 0.3±0.2a | 0.5±0.8a | 0.3±0.3a |
| Armatimonadetes | 0.2±0.1a | 0.3±0.5a | 0.03±0.03a | 0.2±0.1a | 0.2±0.2a | 0.3±0.4a |
| Gemmatimonadetes | 0.2±0.1ab | 0.3±0.4a | 0.1±0.1b | 0.1±0.1ab | 0.1±0.2ab | 0.2±0.1ab |
| Cyanobacteria/Chloroplast | 0.1±0.04b | 0.03±0.01b | 0.003±0.003b | 0.4±0.4a | 0.2±0.1ab | 0.1±0.1ab |
| other | 0.3±0.2ab | 0.4±0.3ab | 0.1±0.1b | 0.3±0.2ab | 0.5±0.3aab | 0.5±0.2a |

**Table S17 Relative abundance of major phylum of bacterial community in rhizosphere samples** (means±SD，n=6). Means within the same line that are followed by the different letter are significantly different at P < 0.05 based on one-way ANOVA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phylum  |  | *B. napus* |  |  | *B. juncea* |  |
|  | CK | Cd10 | Cd30 | CK | Cd10 | Cd30 |
| Proteobacteria | 34.4±5.7b | 39.0±6.7b | 48.8±5.9a | 33.8±1.9b | 34.8±1.9b | 41.9±7.0ab |
| Actinobacteria | 32.0±3.7a | 26.6±10.7ab | 16.9±1.6b | 28.5±6.8ab | 34.7±17.5a | 30.0±7.1a |
| Bacteroidetes | 6.7±2.2b | 10.3±5.8b | 19.3±4.1a | 6.4±3.3b | 7.9±4.9b | 10.4±6.0b |
| Unclassified | 10.9±3.0ab | 9.8±2.4ab | 5.6±0.8d | 12.0±2.6a | 9.3±1.9bc | 6.8±1.4cd |
| Acidobacteria | 4.8±0.9b | 5.9±3.6ab | 4.7±1.2b | 9.2±4.6a | 6.1±2.0ab | 5.8±1.8ab |
| Gemmatimonadetes | 6.6±2.1a | 5.1±1.4b | 2.6±0.4c | 4.8±1.3b | 3.1±0.5c | 2.4±0.6c |
| Chloroflexi | 2.2±2.7a | 1.3±1.0a | 0.6±0.3a | 2.4±2.5a | 2.1±2.1a | 1.3±0.4a |
| Verrucomicrobia | 1.0±0.2a | 0.7±0.3ab | 0.5±0.1b | 0.9±0.4a | 0.6±0.4ab | 0.4±0.1b |
| Nitrospirae | 0.5±0.1a | 0.4±0.2a | 0.4±0.1a | 0.3±0.2a | 0.3±0.2a | 0.3±0.1a |
| other | 0.9±0.4b | 1.0±0.6ab | 0.7±0.2b | 1.6±0.9a | 1.0±0.5ab | 0.7±0.2b |

**Table S18 Relative abundance of major phylum of bacterial community in bulk soil samples** (means±SD，n=6). Means within the same line that are followed by the different letter are significantly different at P < 0.05 based on one-way ANOVA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phylum  |  | *B. napus* |  |  | *B. juncea* |  |
|  | CK | Cd10 | Cd30 | CK | Cd10 | Cd30 |
| Proteobacteria | 39.4±7.6ab | 41.6±15.9ab | 51.4±6.3a | 40.5±5.7ab | 29.7±5.6b | 42.4±12.3ab |
| Actinobacteria | 28.1±12.4ab | 31.3±18.7ab | 17.6±5.0b | 27.6±8.1ab | 42.5±8.6a | 30.9±16.1ab |
| Unclassified | 11.1±2.2a | 8.1±1.9b | 7.6±2.0b | 9.5±1.5ab | 9.3±2.1ab | 7.0±1.6b |
| Bacteroidetes | 3.7±1.1b | 6.1±4.4ab | 7.9±3.4ab | 8.8±3.6a | 6.2±3.5ab | 7.9±3.3ab |
| Acidobacteria | 5.7±2.0a | 4.7±0.9a | 6.5±2.1a | 5.3±1.1a | 5.1±2.2a | 4.5±1.6a |
| Gemmatimonadetes | 7.5±2.1a | 5.0±0.8b | 4.6±1.0b | 5.6±1.0b | 4.1±1.0bc | 2.8±0.8c |
| Firmicutes | 0.4±0.1b | 1.1±1.0b | 2.4±1.2a | 0.5±0.1b | 0.4±0.1b | 2.9±1.4a |
| Chloroflexi | 2.1±3.3a | 1.0±0.8a | 0.4±0.1a | 0.6±0.1a | 1.4±0.5a | 0.9±0.6a |
| Verrucomicrobia | 0.7±0.3a | 0.3±0.1c | 0.4±0.1bc | 0.7±0.2a | 0.5±0.3ab | 0.3±0.1c |
| other | 1.5±0.9a | 0.8±0.2bc | 1.1±0.4ab | 0.8±0.3bc | 0.8±0.3bc | 0.5±0.1c |

**Table S19 Dissimilarity tests of bacterial communities in plant and soil in *B. napus* from two different group types based on Jaccard distance method.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots; R, rhizosphere soil samples; NR, bulk soil samples; CK, treatment with 0 mg/kg Cd; C10, treatment with 10 mg/kg Cd; C30, treatment with 30 mg/kg Cd.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | MRPP | ANOSIM |  | ADONIS |  |
| δ | P | R | P | R | P |
| Plant | Yj | 0.6843 | 0.183 | 0.0724 | 0.085 | 1.0444 | 0.205 |
| Yn | 0.7267 | 0.202 | 0.0312 | 0.324 | 1.0537 | 0.231 |
| Gn | 0.6600 | 0.01 | 0.1790 | 0.006 | 1.5946 | 0.013 |
| CK | 0.6895 | 0.001 | 0.7502 | 0.001 | 3.7554 | 0.001 |
| C10 | 0.6795 | 0.001 | 0.9292 | 0.001 | 4.1441 | 0.001 |
| C30 | 0.7021 | 0.001 | 0.8185 | 0.001 | 3.6897 | 0.001 |
| Soil | R | 0.4684 | 0.003 | 0.3168 | 0.001 | 1.2982 | 0.003 |
| NR | 0.4531 | 0.001 | 0.3779 | 0.001 | 1.3967 | 0.001 |
| CK | 0.4564 | 0.009 | 0.3796 | 0.005 | 1.3335 | 0.016 |
| C10 | 0.4767 | 0.01 | 0.2444 | 0.005 | 1.3413 | 0.014 |
| C30 | 0.4492 | 0.003 | 0.8648 | 0.005 | 1.7615 | 0.004 |

**Table S20 Dissimilarity tests of bacterial communities in plant and soil in *B. juncea* from two different group types** **based on Jaccard distance method.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots; R, rhizosphere soil samples; NR, bulk soil samples; CK, treatment with 0mg/kg Cd; C10, treatment with 10mg/kg Cd; C30, treatment with 30mg/kg Cd.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | MRPP | ANOSIM |  | ADONIS |  |
| δ | P | R | P | R | P |
| Plant | Yj | 0.6580 | 0.069 | 0.1028 | 0.052 | 1.1272 | 0.051 |
| Yn | 0.7598 | 0.093 | 0.1069 | 0.077 | 1.1074 | 0.094 |
| Gn | 0.6403 | 0.024 | 0.1226 | 0.046 | 1.1392 | 0.021 |
| CK | 0.6725 | 0.001 | 0.8452 | 0.001 | 4.4734 | 0.001 |
| C10 | 0.7030 | 0.001 | 0.7995 | 0.001 | 3.6800 | 0.001 |
| C30 | 0.6825 | 0.001 | 0.7847 | 0.001 | 3.8417 | 0.001 |
| Soil | R | 0.4626 | 0.001 | 0.4090 | 0.001 | 1.4335 | 0.001 |
| NR | 0.4574 | 0.007 | 0.1802 | 0.006 | 1.1678 | 0.008 |
| CK | 0.4519 | 0.027 | 0.1592 | 0.036 | 1.1226 | 0.026 |
| C10 | 0.4685 | 0.012 | 0.1537 | 0.042 | 1.2541 | 0.02 |
| C30 | 0.4596 | 0.001 | 0.4703 | 0.003 | 1.4644 | 0.003 |

**Table S21 Mantel analysis of the relationship between the *B.napus*’s bacterial community structure and environmental variables based on Bray Curtis (BC) and Jaccard (JC) method.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | Environmental factors | r.BC | p.BC | r.JC | p.JC |
| Yj | height | 0.0017 | 0.468 | -0.0525 | 0.595 |
| weight | 0.0881 | 0.138 | 0.0383 | 0.398 |
| leaf\_area | 0.0243 | 0.363 | -0.0460 | 0.618 |
| sugar | -0.0413 | 0.568 | -0.0896 | 0.672 |
| protein | -0.0229 | 0.466 | -0.0410 | 0.529 |
| chlorophyll | 0.2498 | 0.105 | 0.5161 | 0.014 |
| SOD | -0.0280 | 0.541 | -0.1257 | 0.944 |
| POD | -0.0108 | 0.46 | -0.0495 | 0.561 |
| CAT | -0.0987 | 0.737 | -0.1032 | 0.731 |
| Leaf\_Cd | 0.0238 | 0.387 | -0.0457 | 0.615 |
| Yn | height | -0.1198 | 0.936 | 0.0944 | 0.148 |
| weight | -0.1067 | 0.922 | 0.2058 | 0.013 |
| leaf\_area | -0.0390 | 0.632 | 0.1967 | 0.01 |
| sugar | -0.1140 | 0.829 | 0.1515 | 0.113 |
| protein | 0.0300 | 0.363 | 0.0691 | 0.256 |
| chlorophyll | 0.0245 | 0.419 | 0.1628 | 0.149 |
| SOD | -0.1184 | 0.881 | -0.0491 | 0.635 |
| POD | 0.1324 | 0.113 | -0.2117 | 0.991 |
| CAT | -0.0115 | 0.502 | -0.0843 | 0.738 |
| Leaf\_Cd | -0.1237 | 0.941 | 0.1069 | 0.123 |
| Gn | height | 0.3623 | 0.012 | 0.2640 | 0.02 |
| weight | 0.2760 | 0.01 | 0.1792 | 0.021 |
| leaf\_area | 0.2758 | 0.015 | 0.2175 | 0.015 |
| ph | 0.1997 | 0.059 | 0.1389 | 0.186 |
| TOC | 0.2614 | 0.046 | 0.0901 | 0.24 |
| TN | -0.0568 | 0.614 | -0.1445 | 0.842 |
| TP | 0.0381 | 0.314 | -0.0603 | 0.547 |
| NH3\_N | 0.0931 | 0.213 | 0.1339 | 0.188 |
| NO3\_N | 0.0248 | 0.342 | 0.0266 | 0.36 |
| AP | 0.0501 | 0.232 | -0.0392 | 0.525 |
| AK | -0.0890 | 0.741 | -0.1269 | 0.725 |
| Root\_Cd | 0.3981 | 0.011 | 0.3021 | 0.016 |

**Table S22 Mantel analysis of the relationship between the *B.juncea*’s bacterial community structure and environmental variables based on Bray Curtis (BC) and Jaccard (JC) method.** Abbreviations: Yj, phyllosphere samples from leaves; Yn, endophytes samples from leaves; Gn, endophytes samples from roots.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | Environmental factors | r.BC | p.BC | r.JC | p.JC |
| Yj | height | 0.0953 | 0.136 | 0.0406 | 0.322 |
| weight | 0.0198 | 0.359 | 0.0008 | 0.471 |
| leaf\_area | 0.0042 | 0.419 | 0.0059 | 0.433 |
| sugar | -0.0074 | 0.475 | 0.0219 | 0.374 |
| protein | 0.0511 | 0.37 | -0.0767 | 0.652 |
| chlorophyll | -0.0079 | 0.509 | 0.0932 | 0.098 |
| SOD | -0.1294 | 0.817 | -0.2503 | 0.987 |
| POD | 0.2040 | 0.058 | 0.1304 | 0.149 |
| CAT | -0.0043 | 0.508 | 0.0353 | 0.358 |
| Leaf\_Cd | 0.0717 | 0.213 | 0.0065 | 0.425 |
| Yn | height | -0.1357 | 0.966 | -0.1282 | 0.939 |
| weight | -0.2053 | 1 | -0.0596 | 0.752 |
| leaf\_area | -0.0884 | 0.829 | 0.1010 | 0.139 |
| sugar | -0.1619 | 0.951 | 0.0045 | 0.507 |
| protein | -0.0477 | 0.521 | -0.0944 | 0.722 |
| chlorophyll | -0.1305 | 0.99 | 0.0075 | 0.43 |
| SOD | -0.0929 | 0.642 | -0.0351 | 0.575 |
| POD | 0.0394 | 0.35 | -0.1317 | 0.841 |
| CAT | -0.1410 | 0.806 | 0.0486 | 0.346 |
| Leaf\_Cd | -0.1740 | 0.996 | -0.1212 | 0.883 |
| Gn | height | 0.0081 | 0.428 | 0.0180 | 0.392 |
| weight | 0.0529 | 0.259 | 0.0472 | 0.284 |
| leaf\_area | 0.1541 | 0.069 | 0.1013 | 0.125 |
| ph | 0.0656 | 0.239 | 0.0929 | 0.171 |
| TOC | 0.1704 | 0.114 | -0.0574 | 0.617 |
| TN | 0.0573 | 0.292 | 0.1142 | 0.174 |
| TP | 0.2060 | 0.084 | 0.1203 | 0.187 |
| NH3\_N | -0.0419 | 0.602 | 0.1061 | 0.242 |
| NO3\_N | -0.1792 | 0.945 | -0.2455 | 0.986 |
| AP | 0.0574 | 0.34 | 0.0097 | 0.432 |
| AK | 0.0690 | 0.241 | -0.0834 | 0.759 |
| Root\_Cd | -0.0423 | 0.663 | 0.0533 | 0.281 |

**Table S23 Mantel analysis of the relationship between the soil bacterial community structure in *B. juncea* and environmental variables** **based on Bray Curtis (BC) and Jaccard (JC) method.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | Environmental factors | r.BC | p.BC | r.JC | p.JC |
| Rhizosphere soil | height | 0.1787 | 0.026 | 0.0923 | 0.17 |
| weight | 0.2354 | 0.01 | 0.1173 | 0.09 |
| leaf\_area | 0.2395 | 0.011 | 0.2229 | 0.026 |
| pH | 0.0784 | 0.239 | 0.0935 | 0.179 |
| TOC | -0.0114 | 0.495 | -0.0151 | 0.491 |
| TN | 0.0916 | 0.256 | 0.2698 | 0.034 |
| TP | 0.1042 | 0.249 | 0.1368 | 0.179 |
| NH3\_N | -0.0444 | 0.587 | 0.2412 | 0.075 |
| NO3\_N | 0.0344 | 0.36 | -0.1025 | 0.741 |
| AP | 0.0581 | 0.368 | 0.1088 | 0.225 |
| AK | -0.1166 | 0.831 | -0.1226 | 0.809 |
| Soil\_Cd | 0.2322 | 0.023 | 0.1021 | 0.183 |
| Bulk soil | pH | 0.4074 | 0.001 | 0.4605 | 0.001 |
| TOC | 0.0334 | 0.38 | 0.0389 | 0.369 |
| TN | 0.0069 | 0.429 | 0.0350 | 0.397 |
| TP | -0.1866 | 0.917 | -0.2467 | 0.959 |
| NH3\_N | 0.0447 | 0.348 | 0.0615 | 0.324 |
| NO3\_N | -0.0866 | 0.674 | -0.0923 | 0.699 |
| AP | -0.0011 | 0.429 | -0.0466 | 0.59 |
| AK | 0.1014 | 0.208 | 0.1447 | 0.134 |
| Soil\_Cd | 0.4449 | 0.005 | 0.5112 | 0.001 |